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ANIMAL HEALTH SCIENCE RESEARCH ADVISORY BOARD

1979 ANNUAL REPORT

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UNITED STATES
DEPARTMENT OF
AGRICULTURE

SCIENCE AND
EDUCATION
ADMINISTRATION

JANUARY 1980

EXECUTIVE SUMMARY

Nationwide concern over the \$4.6 billion annual food animal health loss has led to enactment of authorizing legislation (Subtitle E, Public Law 95-113) and appropriations (Section 1414 (c)(1) and Section 1433 of Public Law 95-113) for Federal support of new extramural programs of animal health and disease research. Fifteen million dollars was appropriated in Fiscal Year 1979 for this research and \$13 million in Fiscal Year 1980.

The Animal Health Science Research Advisory Board, established by the authorizing legislation, has provided consultation and advice to the Secretary which has been essential in implementing this research.

New research was initiated in Fiscal Year 1979 through 424 research projects which seek solutions to high priority food animal and equine health problems. Much of this research is continuing and additional new work has been implemented under Fiscal Year 1980 funding.

This report provides an overview of the programs which have been initiated in Fiscal Year 1979 under new funding including a summary of the areas of research emphasis. As indicated in the summary data, allocations have been made to disease problems of food animals and horses in some approximation to the economic importance of each commodity. Thirty-seven percent of the total funds were allocated to beef cattle disease problems, 18% to Dairy cattle; 19% to swine; 11% to poultry, 5% to sheep and goats; 4% to horses and 3% to aquaculture. Disease problems of each commodity which received greatest financial support are as follows:

- Beef Cattle - respiratory diseases, internal parasites and enteric diseases.
- Dairy Cattle - metabolic diseases, mastitis, and enteric diseases.
- Swine - enteric diseases, pseudorabies and reproductive diseases.
- Poultry - respiratory diseases, internal parasites and toxicoses.
- Sheep and Goats - caseous lymphadenitis, contagious ecthyma and internal parasites.
- Horses - internal parasites, laminitis, and herpes virus (rhinopneumonitis)
- Aquaculture - Erythrocytic necrosis virus and bacterial septicemia.

I. Current Concerns in Animal Health

In the production of food animals one of the major risks faced by the producer is the possibility of substantial loss of animals due to diseases, parasites or other causes. Fifteen to 20 percent of food animals die before reaching market. These losses, plus the treatment costs and growth inefficiencies in animals that recover from illnesses, result in an annual financial loss exceeding \$4.6 billion.

Modern production practices require large numbers of animals in closely confined conditions. This greatly enhances risks of disease. Increased concern over the environment and product safety has reduced livestock management alternatives, e.g., in disposing of waste or in using feed additives in disease prevention. The potential hazards of animal drugs and pesticides need to be clarified. In some cases, practical, effective measures are limited or lacking for serious livestock and poultry health problems. Alternate methods of control need to be developed. Disease agents are continually changing and new agents are encountered frequently. There is current, widespread concern over pseudorabies in swine and brucellosis in cattle. Foreign animal diseases pose a greatly increased hazard with present-day international air transportation of people, animals, and animal products. In 1977 contagious equine metritis was found to be present for the first time in the United States. During this same year, the dreaded swine disease, African swine fever, crossed the Atlantic Ocean to appear and spread in Brazil, the Dominican Republic, Haiti and in 1980 the disease occurred in Cuba.

From an overall viewpoint, diseases reduce efficiency in the production of food animals. Although livestock producers individually must initially absorb disease losses, collectively the anticipated level of losses are passed on to the consumer as one of the costs of producing animal products. In the Nation's long-term outlook these losses will have even greater critical importance in terms of wasted energy resources (feed and other energy requiring production inputs), and in limiting capacity to meet expanding national and international population requirements for high quality protein.

II. The Food and Agricultural Act of 1977 (Public law 95-113)

This Act recognizes the national concern for food animal health and disease and significant new research programs are authorized for the control of these problems in livestock, poultry and aquaculture species. The Department of Agriculture Fiscal Year 1979 Appropriations Act provided funds to activate provisions of Public Law 95-113 covering animal health and disease research (Table 1). Five million dollars was appropriated for formula distribution

under Section 1433. Ten million dollars was made available for animal health research grants under Section 1414 (c)(1). In Fiscal Year 1980 Section 1433 funding has been continued at the level of \$6 million and the Section 1414 (c)(1) at a level of \$7 million. Implementation of these programs is a major milestone in Federal - State cooperative research efforts to solve animal health problems.

(a) Section 1433 (Animal Health and Disease Formula Program)

Under the Section 1433 formula program it now is possible for the Department to strengthen its animal health research partnership with the State Agricultural Experiment Stations, and to extend this partnership to all Colleges of Veterinary Medicine. Provisions of Section 1433 are unique in that funds are distributed to the States in relation to a State's livestock importance and its capacity to conduct animal health and disease research. When more than one eligible institution exist within a State, the State's entitlement is distributed to these institutions in accordance with their animal health research capacities. State contribution to expanded animal health research is encouraged through a requirement that each State match any Section 1433 funds received annually in excess of \$100,000.

States and institutions receiving Section 1433 funds in Fiscal Year 1980 are listed in Table 2. Three-hundred and thirty animal health and disease research projects* were initiated under Fiscal Year 1979 Section 1433 funds. Most of this research is continuing and other new research has been initiated under Fiscal Year 1980 funding.

(b) Section 1414 (c)(1) Special Grants for Animal Health

As discussed in the 1978 Annual Report of the Animal Health Science Research Advisory Board, \$505,762 of Fiscal Year 1979 funds under this Section were made available to 17 States as Supplemental Special Research Grants to permit initiation of viable programs in animal health research. Titles and locations of this research are listed in Table 3.

In Fiscal Year 1979 \$8,951,744 of Section 1414 (c)(1) funds were committed to animal health research in a competitive process. Six-hundred and fifty-nine research proposals covering more than \$110 million of proposed research were evaluated by scientists in three panels - infectious diseases; internal and external parasites; and noninfectious diseases. A list of the 75 projects

*-Titles and locations of this research are listed in the Minutes of the Animal Health Science Research Advisory Board meeting, Sept. 13-14, 1979.

funded as a result of panel recommendations is given in Table 4. As recommended by the Board, placement of these grants included consideration of factors such as scientific merit, priority of the problem to be studied (as listed in the 1978 Annual Report) as well as distribution of funds among the animal commodities in relation to their importance. The following table indicates the resulting distribution of these funds by commodity.

Fiscal Year 1979 Special Research Grants (Competitive)
Animal Health and Disease
Distribution by Commodity

Commodity	Total of Awards	Percent of Total	*Relative Importance of Commodity
Beef Cattle	\$3,098,042	34.6	45%
Dairy Cattle	1,736,570	19.4	25
Swine	1,917,458	21.4	13
Poultry	965,672	10.8	9
Sheep	587,125	6.6	1.5
Horses	311,199	3.5	5.5
Aquaculture	308,067	3.4	1 (Estimated)
Goats	27,611	0.3	----
Total	<u>\$8,951,744</u>	<u>100.0</u>	<u>100</u>

*Comparative standings of the Commodities in contributing to the National totals of livestock value and income.

In response to a Congressional directive a Special Research Grant award of \$242,500 was made to the Michigan Agricultural Experiment Station to study the effect of photoperiodism on dairy production.

III. Distribution of Section 1414 (c)(1) and Section 1433 Funds -
Fiscal Year 1979.

(a) Problem areas

For assessing area of emphasis under these new research programs all animal health and disease problems were classified under three broad areas: infectious diseases, parasitic diseases, and non-infectious diseases (See Table 6). Approximately 63 percent of the formula funds (Section 1433) were allotted to infectious diseases, 13 percent to parasitic diseases and 24 percent to non-infectious diseases. Fifty-five percent of the Special Research Grant funds (Section 1414 (c)(1)) supported research on infectious diseases, 20 percent on parasitic diseases and 25 percent on non-infectious diseases. Of the Supplemental Special Research Grant funds (Section 1414 (c)(1)), 67 percent were allocated to infectious diseases, 28 percent to parasitic diseases and 5 percent to non-infectious diseases.

(b) Allocation of Funds by Commodities

The following table indicates how all animal health funds (formula funds, special research grants and supplemental special research grants) were allocated by commodities in Fiscal Year 1979 in comparison to the relative importance of these commodities.

Commodities	Percent of all funds	Livestock commodities, relative importance*
beef cattle	37.26	45.0%
dairy cattle	17.80	25.0
swine	18.92	13.0
chickens and turkeys	11.25	9.0
sheep and goats	4.93	1.5
horses	3.80	5.5
aquaculture	2.86	1.0 (estimated)
general livestock and poultry	3.18	-
Totals	<u>100.0</u>	<u>100.0</u>

* Based on U.S. Department of Agriculture Data on Livestock Income and Value.

(c) Comparison of Expenditures to Priorities

The Animal Health Science Research Advisory Board recommended that the major disease problems of livestock and poultry receive research attention in the following priority order:

1. respiratory diseases
2. enteric disease
3. reproductive disease
4. internal and external parasites

The following tables show how all funds were allocated in relation to the above recommendations.

Disease Research by Commodity

Commodity	Respiratory disease Percent	Enteric disease Percent	Reproductive disease Percent	Parasitic disease Percent	Other Percent
beef cattle	33.0	12.5	5.2	24.3	25.3
dairy cattle	2.0	8.1	17.3	5.3	67.3
swine	9.1	32.0	10.0	12.0	36.9
chickens and turkeys	32.4	2.4	-	22.5	42.9
sheep and goats	4.4	-	14.7	17.8	63.2
horses	11.9	-	1.5	33.5	53.1
aquaculture	-	-	-	8.2	-
Summary for all Commodities	18.7	12.4	7.2	17.8	43.9

Disease Research by Funding Mechanisms

	Respiratory disease Percent	Enteric disease Percent	Reproductive disease Percent	Parasitic disease Percent	Other Percent
Formula Funds	16.4	14.5	9.3	12.7	52.9
Special Research Grants	18.8	11.6	3.4	19.9	53.7
Supplementary Special Research Grants	28.6	0	16.7	28.0	73.3

Allocations by Major Diseases

Disease problems heavily supported by the Fiscal Year 1979 appropriations are identified by commodities in Tables: 6-15. It should be noted that approximately 23 percent of the support on diseases of dairy cattle was expended on mastitis. Support for metabolic diseases amounted to 33.6 percent of the total funds allocated for diseases of beef and dairy cattle.

Twelve percent of funds invested in swine diseases supported research on pseudorabies and 7.9 percent on agalactia.

Of the funds expended for research on chicken and turkey diseases, approximately 32.4 percent supported research on respiratory diseases and 22.5 percent on parasitic diseases.

Approximately 72 percent of the funds allocated to sheep and goats were expended on caseous lymphadenitis (23.5 percent), contagious ecthyma (20.9 percent), parasitic diseases (17.8 percent) and pregnancy toxemia (9.9 percent).

Most of the research funds allocated for horses were used to support research on parasitic diseases, respiratory disease and laminitis. The percentages were 33.5, 25.7 and 19.3 respectively. Research funds expended on aquaculture were devoted primarily to erythrocytic necrosis virus disease (45.6 percent) and hemorrhagic septicemia (21.6 percent).

Of the funds expended on all species for parasitic diseases approximately 73.3 percent were allocated to internal parasitic diseases. Approximately 29.9 percent of all funds allocated to non-infectious diseases were expended on toxicoses and 28.2 percent on metabolic diseases.

Table 1

Animal Health and Disease Research (P.L. 95-113)

FY 1979

Special Grants 1414 (c) (1) P.L. 95-113

Administration - \$300,000

Dairy Photoperiodism - \$242,500
(Michigan)

Section 1433 Supplementation - \$505,756

Competitive - \$8,951,744

Total \$10,000,000

(Formula Funds) Section 1433, Subtitle E, P.L. 95-113

Eligible Institutions

1. Colleges of Veterinary Medicine
2. State Agricultural Experiment Stations
3. Colleges with Departments of Veterinary Science

Formula (\$5 Million)

USDA Administration	4%	\$200,000
Distribution to States		
Livestock Importance		
Livestock Value	24%	\$1,200,000
Livestock Income	24%	\$1,200,000
Animal Health Research Capacity		
Scientist Funds in Animal Health Research	24%	\$1,200,000
Scientist Years in Animal Health Research	<u>24%</u>	<u>\$1,200,000</u>
	100	\$5,000,000

Table 2

CR-OD-1088-D
December 1979

UNITED STATES DEPARTMENT OF AGRICULTURE
Science and Education Administration
Cooperative Research

FISCAL YEAR 1980 - Distribution of Funds for Eligible Institutions
Authorized under Public Law 95-113, Section 1433, September 29, 1977

State and Institution		:Section 1433 :Formula Funds
ALABAMA	- Agricultural Experiment Station	\$104,005
	Auburn University, Sch. Vet. Med.	27,320
	Tuskegee Institute, Sch. Vet. Med.	24,325
ALASKA	- Agricultural Experiment Station	9,602
ARIZONA	- Agricultural Experiment Station	66,874
ARKANSAS	- Agricultural Experiment Station	83,340
CALIFORNIA	- Agricultural Experiment Station	218,204
	School of Veterinary Medicine.....	85,821
COLORADO	- Agricultural Experiment Station and College of Veterinary Medicine.....	232,980
CONNECTICUT	- Agricultural Experiment Station.....	16,840
DELAWARE	- Agricultural Experiment Station.....	14,901
FLORIDA	- Agricultural Experiment Station.....	94,598
	College of Veterinary Medicine.....	14,011
GEORGIA	- Agricultural Experiment Station.....	46,979
	College of Veterinary Medicine.....	130,171
HAWAII	- Agricultural Experiment Station.....	8,481
IDAHO	- Agricultural Experiment Station.....	73,323
	College of Veterinary Medicine.....	27,517
ILLINOIS	- Agricultural Experiment Station and College of Veterinary Medicine.....	200,909
INDIANA	- Agricultural Experiment Station and School of Veterinary Medicine.....	131,077
IOWA	- Agricultural Experiment Station.....	35,405
	College of Veterinary Medicine.....	311,942
KANSAS	- Agricultural Experiment Station and College of Veterinary Medicine.....	194,993
KENTUCKY	- Agricultural Experiment Station.....	107,071
LOUISIANA	- Agricultural Experiment Station.....	101,978
	College of Veterinary Medicine.....	11,486
MAINE	- Agricultural Experiment Station.....	23,455
MARYLAND	- Agricultural Experiment Station.....	64,442
	Johns Hopkins University.....	15,787
MASSACHUSETTS	- Agricultural Experiment Station.....	23,705
MICHIGAN	- Agricultural Experiment Station and College of Veterinary Medicine.....	148,301
MINNESOTA	- Agricultural Experiment Station.....	81,970
	College of Veterinary Medicine.....	125,357

State and Institution		:Section 1433
		:Formula Funds
		:
MISSISSIPPI	- Agricultural Experiment Station and College of Veterinary Medicine.....	75,867
MISSOURI	- Agricultural Experiment Station..... College of Veterinary Medicine.....	75,175 87,841
MONTANA	- Agricultural Experiment Station.....	106,421
NEBRASKA	- Agricultural Experiment Station.....	180,942
NEVADA	- Agricultural Experiment Station.....	30,751
NEW HAMPSHIRE	- Agricultural Experiment Station.....	16,872
NEW JERSEY	- Agricultural Experiment Station.....	31,407
NEW MEXICO	- Agricultural Experiment Station.....	49,104
NEW YORK	- Agricultural Experiment Station..... College of Veterinary Medicine.....	24,621 203,053
NORTH CAROLINA	- Agricultural Experiment Station and College of Veterinary Medicine.....	125,158
NORTH DAKOTA	- Agricultural Experiment Station.....	67,213
OHIO	- Agricultural Experiment Station..... College of Veterinary Medicine.....	98,576 51,921
OKLAHOMA	- Agricultural Experiment Station..... College of Veterinary Medicine.....	148,637 6,145
OREGON	- Agricultural Experiment Station..... School of Veterinary Medicine.....	58,795 54,644
PENNSYLVANIA	- Agricultural Experiment Station..... Lehigh University..... School of Veterinary Medicine.....	67,793 2,791 74,501
PUERTO RICO	- Agricultural Experiment Station.....	19,280
RHODE ISLAND	- Agricultural Experiment Station.....	12,199
SOUTH CAROLINA	- Agricultural Experiment Station.....	28,671
SOUTH DAKOTA	- Agricultural Experiment Station.....	118,702
TENNESSEE	- Agricultural Experiment Station and College of Veterinary Medicine.....	73,301
TEXAS	- Agricultural Experiment Station and College of Veterinary Medicine.....	425,692
UTAH	- Agricultural Experiment Station.....	52,768
VERMONT	- Agricultural Experiment Station.....	19,305
VIRGINIA	- Agricultural Experiment Station and College of Veterinary Medicine.....	85,377
WASHINGTON	- Agricultural Experiment Station..... College of Veterinary Medicine.....	37,457 94,349
WEST VIRGINIA	- Agricultural Experiment Station.....	21,579
WISCONSIN	- Agricultural Experiment Station.....	225,816
WYOMING	- Agricultural Experiment Station.....	50,106
Subtotal.....		5,760,000
Federal administration.....		240,000
Total, Animal Health and Disease.....		6,000,000

Table 3

SUPPLEMENTARY SPECIAL GRANTS
ANIMAL HEALTH AND DISEASE
FY 1979

Alaska - SAES

Control of Brucellosis in Alaska - Vaccine Testing (\$41,984).

Connecticut - SAES - (Storrs)

Avian Adenoviruses: Factors Affecting Isolate Identification (\$21,527).
Mycoplasmosis in Calves (\$16,545).

Delaware - SAES

Etiology and Control of Respiratory Disease in Commercially-Reared
Broiler Chickens (\$38,852).

Hawaii - SAES

Causes and Control of Reproductive Diseases of Dairy Cattle in Hot
Climates (\$42,248).

Maine - SAES

Pathogenesis and Serology of Viral Agents Under Intensive/Extensive
Poultry Management Situations (\$32,684).

Massachusetts - SAES

Immunity of Susceptible and Resistant Chickens Vaccinated With Marek's
Disease Tumor Cell Antigens (\$30,560).

Nevada - SAES

Immunotherapy of Bovine Ocular Squamous Cell Carcinomas (\$21,380).

New Hampshire - SAES

Nutritive Requirements of Coccidia (Eimeria tenella) in Cell Culture
(\$33,488).

New Jersey - SAES

Broiler Production: Clinical and Biochemical Effects of Aflatoxin
Contamination of Basal Ration (\$23,996).

New Mexico - SAES

Blood Chemistry of Stressed Calves and Its Relation to Respiratory
Disease Level and Treatment (\$10,736).

Puerto Rico - SAES

Therapeutic Efficiency of Rafoxanide Against Fasciola Hepatica in
Naturally Infected Beef Cattle (\$42,836).

Rhode Island - SAES

Diagnosis and Pathogenesis of Diseases and Parasites in Major
Molluscon Aquaculture Species (\$37,316).

South Carolina - SAES

Serum Protein Changes in Response to the Clemson University Fowl
Cholera Vaccine in Turkeys (\$24,296).

APPENDIX VIII (Continued)

Utah - SAES

Transmission of Pathogens to Livestock Fed Poultry Wastes (\$15,524).

Vermont - SAES

Economic Impact of Internal Parasitism in Control Measures in Dairy Heifers (\$33,248).

West Virginia - SAES

Effects and Economic Value of Deworming in West Virginia Beef Cattle (\$32,348).

Wyoming - SAES

Corynebacterium pseudotuberculosis Infections in Sheep (\$6,188).

*SPECIAL GRANT

Michigan - SAES

Growth, Milk Yield and Hormone Response to Photoperiod in Cattle (\$242,500).

Table 4
ANIMAL DISEASE AND HEALTH
PROPOSALS SLECTED FOR FISCAL YEAR 1979 FUNDING UNDER PUBLIC LAW 89-106 AS
AMENDED BY SECTION 1414 OF PUBLIC LAW 95-113

STATE AND NUMBER	INSTITUTION	TITLE AND PRINCIPAL INVESTIGATOR	FUNDS RECOMMENDED
<u>ALABAMA</u> 901-15-181	University of Alabama (Birmingham)	Genetic Variation and Capabilities of Bluetongue Viruses in Relation to Vaccine Development; Polly Roy	\$120,000
901-15-171	Alabama AES, Auburn, University, Auburn, AL	Avian Coccidiosis: Immunological Resistance Against Clinical Infection J. J. Giambrone	\$145,000
<u>CALIFORNIA</u> 901-15-119	Univ. of California Davis (School of Veterinary Medicine)	Evaluation of a Vaccine and of Rapid Diagnostic Methods for a Goat Chlamydial Abortion Agent D. Brooks	\$5,646
901-15-120	Univ. of California Davis (School of Veterinary Medicine)	Development of Dairy Cattle Health and Disease Data Base H. P. Riemann	\$146,837
901-15-186	Univ. of California Davis, CA Dept. of Veterinary Microbiology	Population Dynamics of Internal Parasites of Cattle as Related to the Production and Control of Disease Norman F. Baker	\$215,361
<u>COLORADO</u> 901-15-121	Colorado State Univ. (Coll. of Vet. Med. & Biomedical Sciences) Fort Collins, CO	Purification and Biologic and Immunologic Characterization of Heat Stable Enterotoxins from Porcine and Bovine Enteropathogenic <u>Escherichia coli</u> Robert P. Ellis	\$83,446

STATE AND NUMBER	INSTITUTION	TITLE AND PRINCIPAL INVESTIGATOR	FUNDS RECOMMENDED
<u>COLORADO</u> (Cont'd)			
901-15-172	Colorado State Univ. (Coll. of Vet. Med. & Biomedical Sciences) Fort Collins, CO	Development of a Novel Electron Microscopic Method for the Rapid Detection and Identification of Viruses in Bovine Nasal Washings and Stools William J. Todd	\$110,807
901-15-156	Dept. of Physiology and Biophysics, College of Veteri- nary and Biomedical Sciences, Colorado State Univ., Fort Collins, Colorado	Metabolic Effects of Endo- toxin and Their Reversal Robert W. Phillips	\$122,976
<u>DELAWARE</u> 901-15-122	Univ. of Delaware College of Agr. Sciences, Newark, Delaware	The Role of Peripheral Lymphoid Tissue in Upper Respiratory Tract Infections in Normal and Immunosuppressed Broiler Chickens John E. Dohms	\$47,703
<u>GEORGIA</u> 901-15-123	Univ. of Georgia (Coll. of Vet. Med.), Athens, Georgia	Immunogenetic Analysis of Anti-Viral Immunity in Chickens Louis W. Schierman	\$170,783
901-15-174	Univ. of Georgia (Coll. of Vet. Med.), Athens, Georgia	Control of Coccidiosis by Use of Liposome Encap- sulated Preparation William L. Hanson	\$159,362
901-15-157	Univ. of Georgia Department of Poultry Science, AES, Athens, Georgia	Etiology of Avian Fatty Liver Hemorrhagic Syndrome Leo S. Jensen	\$92,254
<u>IDAHO</u> 901-15-147	Univ. of Idaho (Vet. Res. Lab, Caldwell & Dept. of Vet. Sci.) Moscow, Idaho	Control of <u>Fasciola hepatica</u> by Vaccination and/or Chemo- therapeutic Methods and Eval- uation of Production Effect of the Parasite in Cattle Richard F. Hall	\$95,963

STATE AND NUMBER	INSTITUTION	TITLE AND PRINCIPAL INVESTIGATOR	FUNDS RECOMMENDED
<u>ILLINOIS</u> 901-15-185	Univ. of Illinois at Urbana-Champaign (Coll. of Vet. Med.),	Pathogenesis of Leptospirosis (<u>L. hardjo</u> and <u>L. szwajizak</u>) in Goats to Serve as Model Studies of Leptospiral Mastitis and Infertility in Cattle D. N. Tripathy	\$72,900
901-15-158	Dept. of Veterinary Biosciences, Coll. of Vet. Med., Univ. of Illinois, Urbana, Illinois	Toxicodynamics in Trichothe- cene Mycotoxins in Swine and Cattle William B. Buck	\$134,176
<u>INDIANA</u> 901-15-124	Purdue University (School of Vet. Med. and AES) West Lafayette, Indiana	Mycoplasmal Pneumonia of Swine (MPS) - Immunodia- gnosis via the Enzyme Linked Immunosorbent Assay, Indirect Hemagglutination Test, Indirect Fluorescent Antibody Test and Complement Fixation Test Charles H. Armstrong and M. James Freeman	\$74,229
901-15-184	Purdue University (School of Vet. Med. and AES) West Lafayette, Indiana	Proliferative Hemorrhagic Enteropathy of Swine H. L. Thacker	\$137,540
901-15-148	Dept. of Entomology Purdue University AES, West Lafayette, IN.	Implementation of Management Strategies for Hog Lice and Sarcoptic Mange Mites Based on Their Detrimental Effects to Swine Production Ralph E. Williams	\$137,980
901-15-187	Purdue University (School of Vet. Med. and AES, West Lafayette, Indiana	Interactions Between Certain Economically Important Enteric Agents in Baby Pigs Erskine V. Morse	\$162,763
<u>IOWA</u> 901-15-128	Iowa State Univ. (Coll. of Vet. Med.), Ames, Iowa	Pseudorabies (Aujeszky's Diseases:) L. E. Evans	\$296,000
901-15-196	Iowa State Univ. (Coll. of Vet. Med.), Ames, Iowa	Prevalence and Control of Swine Dysentery D. L. Harris	\$139,115

STATE AND NUMBER	INSTITUTION	TITLE AND PRINCIPAL INVESTIGATOR	FUNDS RECOMMENDED
<u>IOWA</u>			
(Cont'd)			
901-15-133	Iowa State Univ. (Coll. of Vet. Med.), Ames, Iowa	<u>Viral Enteritis of Neonatal Calves (scours)</u> Comparative Antigenic and Virulence Properties of Rotaviruses Isolated from Calves and Identification of Newly Demonstrated Viruses G. N. Woode	\$178,725
901-15-126	Iowa State Univ. (Coll. of Vet. Med.), Vet. Medical Research Institute Ames, Iowa	Resistance Factors in Coliform Mastitis of Sows R. F. Ross	\$87,487
901-15-125	Iowa State Univ. (Coll. of Vet. Med.), Ames, Iowa	Swine Tuberculosis I. Development and Evaluation of a Rapid Serodiagnostic Test C. O. Thoen	\$65,700
901-15-127	Iowa State Univ. (Coll. of Vet. Med.), Ames, Iowa	Effects of <u>E. coli</u> Enterotoxins on Porcine Enterocyte Function F. A. Ahrens	\$126,033
901-15-159	Iowa AHES, Ames, Iowa	Factors Influencing the Incidence of Milk Fever, Prevention of Milk Fever, and Vitamin D. Metabolism of Several Domestic Species Donald C. Beitz	\$128,395
901-15-160	Iowa AHES, Ames, Iowa	Ketosis in Dairy Cattle: Interrelations with Carbohydrate and Lipid Metabolism J. W. Young	\$126,326
<u>KENTUCKY</u>			
901-15-161	Kentucky AES, Dept. of An. Sciences, Univ. of Kentucky, Lexington, KY	Renal Function in Bovine Grass Tetany; R. E. Tucker	\$149,310
<u>LOUISIANA</u>			
901-15-129	Louisiana State Univ., Baton Rouge, School of Veterinary Medicine	Anaerobic Cell Culture Assay for Toxins from <u>Fusobacterium necrophorum</u> A. Roland Dommert	\$64,016
901-15-149	Louisiana State Univ., Baton Rouge, Louisiana, AES	Development of a Vaccine Against <u>Strongylus vulgaris</u> in the Horse T. R. Klei	\$142,010

STATE AND NUMBER	INSTITUTION	TITLE AND PRINCIPAL INVESTIGATOR	FUNDS RECOMMENDED
<u>MICHIGAN</u> 901-15-192	Michigan State Univ. (Coll. of Vet. Med.), East Lansing, MI	Abortions and "Wasting Disease" in Dairy Goats C. S. F. Williams	\$21,965
<u>MINNESOTA</u> 901-15-182	Univ. of Minnesota (Coll. of Vet. Med.), St. Paul, MN	Epidemiology of Delayed Return to Estrus and Pregnancy Loss in Swine Allen D. Leman	\$163,000
901-15-130	Univ. of Minnesota (Coll. of Vet. Med.), St. Paul, MN	Factors Affecting Salmonella Infections in Livestock During Transport and Marketing; Robert A. Robinson	\$112,379
901-15-131	Univ. of Minnesota (Coll. of Vet. Med.), St. Paul, MN	Evaluation of Immunologic Responses and Aspects of Pathogenesis J. M. B. Kaneene	\$59,545
901-15-132	Univ. of Minnesota, St. Paul, MN, Dept. of Large Animals Clinical Sciences; (Coll. of Vet. Med.)	Modulation of Pulmonary Clearance of Pasteurella Hemolytica from the Bovine Lung by Levamisole and Viral Infection Charles C. Muscoplat	\$172,139
901-15-191	Depts. of Plant Pathology and Animal Science, Univ. of Minnesota, St. Paul, Minnesota	Fusarium Mycotoxins (Zeara- lenone, Deoxynivalenol, 3- Acetyldeoxynivalenol, Niva- lenol, Deacetoxyscirpenol and Unknown Toxins in Fusarium Culture and Their Effect on the Health of Poultry (Chickens and Turkeys) Chester J. Mirocha	\$113,410
901-15-162	(Coll. of Vet. Med.), Univ. of Minnesota, St. Paul, MN)	Osteochondrosis in Growing Boars: Identification of the Age of Onset and Progression of Histologic, Histochemical and Radiographic Lesions H. D. Hilley	\$99,386
<u>MISSOURI</u> 901-15-175	Univ. of Missouri, (Coll. of Vet. Med.), Columbia, Missouri	Endotoxins in the Pathogenesis of Lactation Failure (MMA) in Swine R. G. Elmore	\$93,235
901-15-164	Univ. of Missouri, AES, Columbia, Missouri	Hematologic and Immunologic Response of Cattle to T-2 Fusarium Mycotoxin Gary D. Osweiler	\$133,464

STATE AND NUMBER	INSTITUTION	TITLE AND PRINCIPAL INVESTIGATOR	FUNDS RECOMMENDED
<u>MISSOURI</u>			
(Cont'd)			
901-15-163	Univ. of Missouri, (Coll. of Vet. Med.), Columbia, Missouri	Endotoxemia and Lactic Acid- osis: Their Specific and Com- bined Contributions to Equine Laminitis Onset Harold E. Garner	\$104,670
<u>MONTANA</u>			
901-15-150	Montana State Univ. AES Bozeman, Montana	Experimentally Induced Toxo- plasmosis in Cattle: Clinical Disease, Abortion, and Public Health Significance. J. P. Dubey	\$99,189
<u>NEBRASKA</u>			
901-15-179	Univ. of Nebraska AES Lincoln, Nebraska	<u>Mycoplasmataceae</u> as Concurrent Infecting Agents in Viral Respiratory Infections in Cattle Merwin L. Frey	\$121,835
<u>NEW YORK</u>			
901-15-135	Cornell University, (Coll. of Vet. Med.), Ithaca, New York	Mechanisms of Deep Lung Clearance in Cattle and Calves D. O. Slauson	\$227,754
901-15-134	Cornell University, (Coll. of Vet. Med.), Ithaca, New York	Acute Diarrheal Diseases of Neonatal Calves: Non- Antibiotic Methods for Therapy and Control Bud C. Tennat	\$106,300
901-15-136	Cornell University, (Coll. of Vet. Med.), Ithaca, New York	Development of Strains of Streptococcus Equi Rich in M Protein Content for Use in Strangles Vaccines John F. Timoney	\$64,519
	New York State Coll. of Agriculture and Life Sciences, Cornell University, Ithaca, New York	Effect of Face Fly, <u>Musca</u> <u>autumnalis</u> DeGeer, Feeding Activity on Milk Yield in Dairy Cows E. T. Schmidtman	\$58,500
<u>OHIO</u>			
901-15-138	Ohio Agricultural Research and Deve- lopment Center, Wooster, Ohio	The Use of Zinc in the Control of Bovine Contagious Foot Rot Robert F. Cross	\$13,780

STATE AND NUMBER	INSTITUTION	TITLE AND PRINCIPAL INVESTIGATOR	FUNDS RECOMMENDED
<u>OHIO</u>			
(Cont'd)			
901-15-194	Ohio State University (Coll. of Vet. Med.), Columbus, Ohio	Effect of Intramammary Vaccination During the Non- Lactating Period on the Incidence of Bovine Under Infections and Milk Pro- ductivity S. Targowski	\$149,500
901-15-137	Ohio Agricultural Research and Deve- lopment Center, Wooster, Ohio	Development of Improved Methods for Diagnosing Enteric Viral Diseases of Pigs Edward H. Bohl	\$105,026
901-15-165	Ohio Agricultural Research and Deve- lopment Center, Wooster, Ohio	Retained Placenta and Selenium Deficiency in Dairy Cows H. R. Conrad	\$103,779
901-15-183	Ohio State University (Coll. of Vet. Med.), Columbus, Ohio	Prevention of Parturient Hypocalcemia ("Milk Fever") by the Active Metabolite of Vitamin D3 1, 25-Dihydroxycholecalciferol Charles C. Capen	\$124,909
<u>OKLAHOMA</u>			
901-15-154	Oklahoma State Univ. AES, Stillwater, Oklahoma	Injury Threshold and Eco- nomic Impact of Face Flies on Beef Cattle Russell W. Wright	\$88,630
901-15-152	Oklahoma State Univ. (Coll. of Vet. Med., Animal Disease Research, Stillwater, Oklahoma	Susceptibility of <u>Ichthy-</u> <u>ophthirus multifiliis</u> of Channel Catfish Exposed to Sublethal Concentrations of Copper Sidney A. Ewing	\$33,388
901-15-153	Oklahoma AES, Dept. of Entomology, Oklahoma State Univ. Stillwater, Oklahoma	Lone Star Tick Management for Cattle J. Alexander Hair	\$90,000
<u>OREGON</u>			
901-15-140	Oregon State Univ., (Sch. of Vet. Med.), Corvallis, Oregon	Development of Protective, Non-Toxic Pasteurella Heomlytica Vaccine Against Bronchopneumonia in Weaning Calves M. Matsumoto	\$133,384

STATE AND NUMBER	INSTITUTION	TITLE AND PRINCIPAL INVESTIGATOR	FUNDS RECOMMENDED
<u>OREGON</u>			
(Cont'd)			
901-15-139	Oregon State University AES, Corvallis, Oregon	Development of a Subunit Vaccine to the Salmonid Virus, <u>Infectious hematopoietic necrosis virus</u> , by Molecular J. C. Leong	\$186,402
901-15-178	Oregon State University (Sch. of Vet. Med.) Corvallis, Oregon	The Prevention of The Caus- ative Factors in Acute Bovine Pulmonary Emphysema A. M. Craig	\$136,009
<u>PENNSYLVANIA</u>			
901-15-141	Univ. of Pennsylvania (Sch. of Vet. Med.), Philadelphia, PA (Kennett Square)	Glucose Metabolism, Cardio- vascular Function and Mortality, J. M. Naylor	\$47,870
901-15-190	Univ. of Pennsylvania (Sch. of Vet. Med.), Philadelphia, PA	Pathogenesis and Control of Paturient Paresis C. F. Ramberg	\$123,175
901-15-166	Univ. of Pennsylvania (Sch. of Vet. Med.), Philadelphia, PA	Endotoxic Shock and Pregnancy Toxemia in Sheep D. S. Kronfeld	\$69,432
901-15-189	Univ. of Pennsylvania (Sch. of Vet. Med.), Philadelphia, PA	Abomasal Displacements (AD) in Cattle: Epidemiology, Genetics and Etiology Robert H. Whitlock	\$113,000
<u>RHODE ISLAND</u>			
901-15-142	Univ. of Rhode Island College of Resource Development, Kingston, Rhode Island	Control of Adenovirus and Virus 127 (Egg Drop Syndrome) Infections in Poultry Through a Clarification of Host(s)- Parasite Relationships Vance J. Yates	\$94,736
<u>TENNESSEE</u>			
901-15-177	Univ. of Tennessee, (Coll. of Vet. Med. and AES) Knoxville, Tennessee	Effect of Bovine Virus Diarrhea (BVD) Virus on Bovine Respiratory Tract Disease (BRTD) and on Pulmonary Immunity Leon N. D. Potgieter	\$134,239
901-15-167	Univ. of Tennessee, (Coll. of Vet. Med. and AES) Knoxville, Tennessee	Biochemical and Histological Evaluation of Thiamin Effects on Lead Intoxication in Cattle G. R. Bratton	\$155,610

STATE AND NUMBER	INSTITUTION	TITLE AND PRINCIPAL INVESTIGATOR	FUNDS RECOMMENDED
<u>TENNESSEE</u>			
(Cont'd)			
901-15-168	Univ. of Tennessee, AES, Knoxville, Tennessee	Platelet Function in Hypo- magenesemic Ruminants J. K. Miller	\$117,540
<u>TEXAS</u>			
901-15-143	Texas A&M University (Coll. of Vet. Med.) College Station, Texas	Caseous Lymphadenitis Infect- tions in Small Ruminants Charles W. Livingston, Jr.	\$114,970
901-15-144	Texas A&M University (Coll. of Vet. Med.) College Station, Texas	Disease Management in Cat- fish Aquaculture D. H. Lewis	\$88,277
901-15-155	Texas AES, Texas A&M University, College Station, Texas	Ecology and Control of Cattle Fever Ticks (<u>Boophilus</u> sp.) P. D. Teel	\$180,031
<u>VIRGINIA</u>			
901-15-188	Dept. of Veterinary Science, Virginia Polytechnic Institute, and State Univ. Blacksburg, Virginia	Identification and Characteri- zation of and Vaccination with Parasite Responsible for the Patho-Physiology of Ostertagi- asis Bruce Hammerberg	\$175,000
<u>WASHINGTON</u>			
901-15-176	Washington State Univ., (Coll. of Vet. Med.), Pullman, Washington	Antigenic and Genetic Markers of Contagious Ecthyma Virus and other Poxviruses of Goats and Sheep for Epidemiological and Vaccine Studies Dieter Burger	\$147,063
901-15-169	Washington State Univ., AES, Pullman, Washington	Prevention of Acute Bovine Pulmonary Edema and Emphysema under Field Conditions James R. Carlson	\$123,027
<u>WISCONSIN</u>			
901-15-146	Univ. of Wisconsin, (Dept. of Veterinary Science; College of Agriculture & Life Sciences) Madison, Wisconsin	Role of Newcastle Disease in Market Condemnation of Turkeys Robert P. Hanson	\$178,424

STATE AND NUMBER	INSTITUTION	TITLE AND PRINCIPAL INVESTIGATOR	FUNDS RECOMMENDED
901-15-145	Univ. of Wisconsin (Dept. of Wisconsin Science & Laboratory of Genetics, College of Agriculture and Life Sciences) Madison, Wisconsin	The Major Histocompatibility Complex in Immunity to Infectious Bovine Rhinotra- cheitis Virus Gary A. Splitter	\$155,176
901-15-180	Univ. of Wisconsin (College of Agriculture and Life Sciences) Madison, Wisconsin	Identification and Enhance- ment of Mastitis Resistance Factors L. H. Schultz	\$131,490

TABLE 5. DISTRIBUTION OF FISCAL YEAR 1979 ANIMAL HEALTH RESEARCH FUNDS BY COMMODITY

	Formula Funds	Special Grants	Supplemental Special Grants	Totals
Beef Cattle	32% 1,694,927	65% 3,452,226	3% 164,808	37.26% 5,311,96
Dairy Cattle	39% 1,002,118	57% 1,444,140	4% 92,041	17.80% 2,538,299
Swine	27% 723,520	73% 1,974,084	0 ---	18.92% 2,697,604
Chickens, Turkeys	25% 396,519	62% 1,001,672	13% 205,403	11.25% 1,603,594
Sheep, Goats	34% 236,101	65% 460,356	1% 6,188	4.93% 702,645
Horses	42% 229,818	58% 311,199	0 ---	3.80% 541,017
Aquaculture	15.5% 63,054	75.5% 308,067	9% 37,316	2.86% 408,437
General Livestock and Poultry	100% 453,943	0 ---	0 ---	3.18% 453,943
Totals	33.7% 4,800,000	62.8% 8,951,744	3.5% 505,756	100.00% 14,257.500

TABLE 6. DISTRIBUTION OF FISCAL YEAR 1979 ANIMAL HEALTH RESEARCH FUNDS BY PROBLEM AREAS AND COMMODITIES

	Formula Funds Section 1433			Special Grants Section 1414 (c) (1)			Supplemental Special Grants Section 1414 (c) (1)			Total for Species
	infectious diseases	parasitic diseases	non-infec. diseases	infectious diseases	parasitic diseases	non-infec. diseases	infectious diseases	parasitic diseases	non-infec. diseases	
Beef Cattle	64% 1,088,725	21% 358,454	15% 247,748 1,694,927	50% 1,713,504	25% 856,674	25% 882,048 3,452,226	54% 89,624	46% 75,184	--- 164,808	37.26% 5,311,961
Dairy Cattle	62% 619,803	4% 43,100 Total...1,002,118	34% 339,215	46% 666,056	4% 58,500 Total...1,444,140	50% 719,584	64% 58,793	36% 33,248 Total... 92,041	--- ---	17.80% 2,538,299
Swine	70% 506,663	4% 26,750 Total ... 723,520	26% 190,107	70% 1,383,891	15% 300,743 Total...1,974,084	15% 289,450	---	---	---	18.92% 2,697,604
Chickens and Turkeys	73% 288,878	6% 23,076 Total ... 396,519	21% 84,56	49% 491,646	30% 304,362 Total...1,001,672	21% 205,664	72% 147,919	16% 33,488 Total...205,403	12% 23,966	11.25% 1,603,594
Sheep Goats	69% 162,661	16% 37,267 Total ... 236,101	15% 36,173	66% 303,424	19% 87,500 Total ... 460,356	15% 69,432	100% 6,188	---	---	4.93% 702,645
Horses	56% 128,717	17% 39,025 Total ... 229,818	27% 62,076	21% 64,519	45% 142,010 Total ... 311,199	34% 104,670	---	---	---	3.80% 541,017
Aquaculture	89% 56,054	---	11% 7,000 Total ... 229,818	89% 274,679	11% 33,388 Total ... 308,067	---	100% 37,316	---	---	2.86% 408,437
General Livestock & Poultry	38% 170,112	18% 82,672 Total ... 453,943	44% 201,159							3.18% 453,943
Total	63% 3,021,613	13% 610,344	24% 1,168,043	55% 4,897,719	20% 1,783,177	25% 2,270,848	67% 339,840	28% 141,920	5% 23,996	100.00% 14,257,500
	Formula Funds - 4,800,000			Special Grant Funds - 8,951,744			Supplemental Special Grant Funds - 505,756			GRAND TOTAL

TABLE 7. BEEF CATTLE - DISTRIBUTION OF FISCAL YEAR 1979 ANIMAL HEALTH RESEARCH FUNDS

Infectious Diseases	Formula Funds Section 1433	Special Grants Sec. 1414(c) (1)	Supplementary Special Grants Sec. 1414(c) (1)	Totals
Respiratory	423,934	1,055,334	10,736	1,490,004
Reproductive	110,134	65,995	41,984	218,113
Enteric	258,036	408,159	---	666,195
Bluetongue	37,986	120,000	---	157,986
Cancer	88,386	---	21,380	109,766
Pinkeye	51,503	---	---	51,503
Other	118,746	64,016	15,524	198,186
Totals	1,088,725	1,713,504	89,624	2,891,853
Parasitic Diseases				
Internal Parasites	303,114	498,013	75,184	876,311
External Parasites	55,340	358,661	---	414,001
Totals	358,454	856,674	75,184	1,290,312
Non-infectious Diseases				
Toxicosis	81,063	356,162	---	473,225
Respiratory	---	259,036	---	259,036
Reproductive	55,545	---	---	55,545
Metabolic Problems	---	266,850	---	266,850
Other	111,140	---	---	111,140
Totals	247,748	882,048	none	1,129,796
Grand Total for Beef Cattle	1,694,927	3,452,226	164,808	5,311,961

TABLE 8. DAIRY CATTLE - DISTRIBUTION OF FISCAL YEAR 1979 ANIMAL HEALTH RESEARCH FUN

Infectious Diseases	Formula Funds Section 1433	Special Grants Sec. 1414(c) (1)	Supplementary Special Grants Sec. 1414(c) (1)	Totals
Mastitis	156,124	428,834	---	584,958
Respiratory	34,442	---	16,545	50,987
Reproductive	215,289	66,450	42,248	323,987
Enteric	181,948	23,935	---	205,883
Other	32,000	146,837	---	178,837
Totals	619,803	666,056	58,793	1,344,652

Parasitic Diseases				
Internal Parasites	38,100	---	33,248	71,348
External Parasites	5,000	58,500	---	63,500
Totals	43,100	58,500	33,248	134,848

Non-infectious Diseases				
Metabolic Problems	82,513	502,805	---	585,318
Reproductive Problems	113,994	---	---	113,994
Retained Placenta	---	103,799	---	103,779
Toxicoses	44,648	---	---	44,648
Other	98,060	113,000	---	211,060
Totals	339,215	719,584	none	1,058,799
Grand Total for Dairy Cattle	1,002,118	1,444,140	92,041	2,538,299

TABLE 9. SWINE - DISTRIBUTION OF FISCAL YEAR 1979 ANIMAL HEALTH RESEARCH FUNDS

Infectious Diseases	Formula Funds Section 1433	Special Grants Sec. 1414(c) (1)	Supplementary Special Grants Sec. 1414(c) (1)	Totals
Respiratory	106,320	139,929	---	246,249
Reproductive	90,455	163,000	---	253,455
Enteric	217,119	604,340	---	863,182
Pseudorabies	23,241	296,000	---	319,241
Agalactia	31,533	180,622	---	214,155
Other	38,000	---	---	38,000
Totals	506,668	1,383,891	none	1,890,559

Parasitic Diseases				
Internal Parasites	26,750	162,763	---	189,513
External Parasites	---	137,980	---	137,980
Totals	26,750	300,743	none	327,493

Non-infectious Diseases				
Toxicoses	20,168	190,064	---	210,232
Reproductive	17,737	---	---	17,737
Iron Deficient Anemia	35,594	---	---	35,594
Other	116,608	99,386	---	215,994
Totals	190,107	289,450	none	479,557
Grand Total for Swine	723,525	1,974,084	none	2,697,609

TABLE 10. CHICKENS AND TURKEYS - DISTRIBUTION OF FISCAL YEAR 1979 ANIMAL HEALTH RESEARCH FUNDS

Infectious Diseases	Formula Funds Section 1433	Special Grants Sec. 1414(c) (1)	Supplementary Special Grants Sec. 1414(c) (1)	Totals
Respiratory	89,385	491,646	117,359	519,966
Enteric	38,440	---	---	38,440
Marek's	24,250	---	30,560	54,810
Immunogenetics	45,551	---	---	45,551
Other	91,252	---	---	91,252
Totals	288,878	491,646	147,919	750,019

Parasitic Diseases				
Internal Parasites	14,000	304,362	33,488	351,850
External Parasites	9,076	---	---	9,076
Totals	23,076	304,362	33,488	360,926

Non-infectious Diseases				
Toxicoses	38,621	92,254	23,996	154,871
Immunity	43,444	---	---	43,444
Fatty Liver and Other	2,500	113,410	---	115,910
Totals	84,565	205,664	23,966	314,225

Grand Total for Chickens and Turkeys	396,519	1,001,672	205,403	1,603,594
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TABLE 11. SHEEP AND GOATS - DISTRIBUTION OF FISCAL YEAR 1979 ANIMAL HEALTH RESEARCH FUNDS

Infectious Diseases	Formula Funds Section 1433	Special Grants Sec. 1414(c) (1)	Supplementary Special Grants Sec. 1414(c) (1)	Totals
Respiratory	30,731	---	---	30,731
Reproductive	28,188	5,646	---	33,834
Caseous Lymphadenitis	44,045	114,970	6,188	165,203
Bluetongue	10,297	---	---	10,297
Contagious Ecthyma	---	147,063	---	147,063
Other	49,400	35,745	---	85,145
Totals	162,661	303,424	6,188	472,273

Parasitic Diseases				
Internal Parasites	25,000	87,500	---	112,500
External Parasites	12,267	---	---	12,267
Totals	37,267	87,500	none	124,767

Non-infectious Diseases				
Predator Control	3,076	---	---	3,076
Toxicoses	33,097	---	---	33,097
Pregnancy Toxemia	---	69,432	---	69,432
Totals	36,173	69,432	none	105,605
Grand Total for Sheep and Goats	236,101	460,356	6,188	702,645

TABLE 12. HORSES - DISTRIBUTION OF FISCAL YEAR 1979 ANIMAL HEALTH RESEARCH FUNDS

Infectious Diseases	Formula Funds Section 1433	Special Grants Sec. 1414(c) (1)	Supplementary Special Grants Sec. 1414(c) (1)	Totals
Infectious Anemia	14,522	---	---	14,522
Herpes Virus	74,695	---	---	74,695
VEE	5,000	---	---	5,000
Respiratory (Strangles)	---	64,519	---	64,519
Other	34,500	---	---	34,500
Totals	128,717	64,519	none	193,236

Parasitic Diseases				
Internal Parasites	39,025	142,010	---	181,035
External Parasites	---	---	---	---
Totals	39,025	142,010	none	181,035

Non-infectious Diseases				
Reproductive	8,076	---	---	8,076
Toxicoses	14,500	---	---	14,500
Colic f	2,500	---	---	2,500
Laminitis	---	104,670	---	104,670
Other	37,000	---	---	37,000
Totals	62,076	104,670	none	166,746
Grand Total for Horses	229,818	311,199	none	541,017

TABLE 13. AQUACULTURE - DISTRIBUTION OF FISCAL YEAR 1979 ANIMAL HEALTH RESEARCH FUNDS

Infectious Diseases	Formula Funds Section 1433	Special Grants Sec. 1414 (c) (1)	Supplementary Special Grants Sec. 1414 (c) (1)	Totals
Epidemiology-control	21,576	---		21,576
Erythroytic Necrosis Virus	21,794	186,402		208,196
Bacterial Septicemia	---	88,277		88,277
Molluscan diseases	---	---	37,316	37,316
Transmission Feral Fish	12,684	---		12,684
Totals	56,054	274,679	37,316	368,049

Parasitic Diseases				
Internal Parasites	---	---	---	---
Ichthyophthirius multifiliis External Parasites	---	33,388	---	33,388
Totals	none	33,388	---	33,388

Non-infectious Diseases				
Trace Mineral Imbalance	7,000	---	---	7,000
Totals	7,000	none	none	7,000
Grand Total for Aquaculture	63,054	308,067	37,316	408,437

TABLE 14. GENERAL LIVESTOCK AND POULTRY - DISTRIBUTION FOR FISCAL YEAR 1979 ANIMAL
HEALTH RESEARCH FUNDS

Infectious Diseases	Formula Funds Section 1433	Special Grants Sec. 1414(c) (1)	Supplementary Special Grants Sec. 1414(c) (1)	Totals
Epidemiology and Diagnosis (ELISA)	136,636	---	---	136,636
Other	33,476	---	---	33,476
Totals	170,112	none	none	170,112

Parasitic Diseases				
Internal Parasites	77,047	---	---	77,047
Ichthyophthirius multifiliis External Parasites	5,625	---	---	5,625
Totals	82,672	none	none	82,672

Non-infectious Diseases				
Toxicoses	142,162	---	---	142,162
Basic Immunity	25,000	---	---	25,000
Other	33,997	---	---	33,997
Totals	201,159	none	none	201,159
Grand Total for General Livestock and Poultry	453,943	none	none	453,943

